

3rd European PEFC Forum

July 4 to July 8, 2005

Kultur- und Kongresszentrum Luzern

Session Schedule Overview

Day	Event
	3rd European PEFC Forum Session Sequence "B"
Tuesday - July 5	
09:00	Joint Session with Fuel Cells for a Sustainable World
11:00	"
14:00	B03 Material Degradation in PEFCs
16:00	B04 New Materials for PEFCs
Wednesday - July 6	
09:00	B05 Spatially Resolved Characterization
11:00	B06 Mathematical Fuel Cell Modeling
14:00	B07 Model-Based Analysis of Fuel Cell Components
16:00	B08 Poster Presentation
Thursday - July 7	
09:00	B09 Systems and Components
11:00	B10 Applications
14:00	B11 Development of DMFC Materials
16:00	B12 Reforming
Friday - July 8	
09:00	Joint Session with Fuel Cells for a Sustainable World
11:00	"

3rd European PEFC Forum

Oral Program

Tuesday, July 5, 14:00 – 15:30

Session B03

Material Degradation in PEFCs

B031 Investigation of Degradation Mechanisms Relevant to Automotive Fuel Cells

Mahesh Murthy and Nick Sisifo
W. L. Gore & Associates, Inc., Elkton, MD / USA

B032 Investigation of Degradation Effects of DMFC MEAs in the First Few Days of Operation

Johannes Schirmer and Norbert Wagner
German Aerospace Center, Stuttgart / Germany

B033 Accelerated Aging Tests of Catalysts

Anthony Kucernak and Alice Sleightholme
Imperial College, London / United Kingdom

B034 Study of MEA Degradation in Operating PEM Fuel Cells

Sylvie Escribano¹, Arnaud Morin¹, Sébastien Solan¹, Benoît Sommacal¹,
Philippe Capron², Isabelle Rougeaux² and Gérard Gébel³

¹CEA Grenoble, DRT/LITEN, SGPAC/LPAC, Grenoble / France

²CEA Grenoble, DRT/LITEN, DTEN/STN/LTS, Grenoble / France

³CEA Grenoble, DSM/DRFMC, Grenoble / France

B035 Performance and Endurance of PEFC Single Cells and Stacks Fed with Hydrogen and Reformate

Tom Smolinka¹, Ursula Wittstadt¹, Manfred Grünerpel² and Werner Lehnert²

¹Fraunhofer Institute for Solar Energy Systems, Freiburg / Germany

²Center for Solar Energy and Hydrogen Research, Ulm / Germany

B036 PEMFC Durability Test under Specific Dynamical Current Solicitation Linked to Vehicle Road Cycle

Fabien Harel², Xavier François¹, Denis Candusso², Marie-Cécile Péra¹,
Daniel Hissel¹ and Jean-Marie Kauffmann¹

¹Laboratory of Electrical Engineering and Systems, Belfort / France

²Inst. Nat. de Recherche sur les Transports et leur Sécurité, Arcueil / France

Tuesday, July 5, 16:00 – 17:30

Session B04

New Materials for PEMFCs

B041 Proton Conducting Membranes for the High Temperature Polymer Electrolyte Membrane Fuel Cell (HT-PEMFC)

Michael Jeske, Christian Soltmann, Christian Ellenberg, Michaela Wilhelm, Dietmar Koch and Georg Grathwohl
University of Bremen, Bremen / Germany

B042 Temperature Dependence of Oxygen Reduction Catalyzed by Cobalt Fluoro-Phthalocyanine Adsorbed on a Graphite Electrode

Chaojie Song¹, Lei Zhang¹, Jiujuun Zhang¹, David Wilkinson^{1,2}
and Ryan Baker^{1,2}

¹National Research Council Canada, Vancouver, British Columbia / Canada

²University of British Columbia, Vancouver, British Columbia / Canada

B043 Fabrication and Characterization of Micro-Structured Glassy Carbon Electrodes for Micro Fuel Cells

Markus Kuhnke, Thomas Lippert, Günther G. Scherer and Alexander Wokaun
Paul Scherrer Institut, Villigen PSI / Switzerland

B044 Porphyrin-Based Catalysts for PEMFC Cathodes

Anders Lundblad, Yohannes Kiros, Anneli Önsten, Frédéric Jaouen
and Göran Lindbergh
Royal Institute of Technology, Stockholm / Sweden

B045 Control of Water Profile and Development of Dimensionally Stable Sulfonated Polyaromatic PEMFC Membranes

Deborah J. Jones, Frédéric Grasset, Mathieu Marrony and Jacques Rozière
Université Montpellier II, Montpellier / France

B046 Electrochemical Study of an Anion-Exchange Membrane Fuel Cell

Antoine Latour, Mauricio Schieda, Max Perrin, Audrey Martinet
and Didier Marsacq
CEA Grenoble DTEN, Grenoble / France

Wednesday, July 6, 09:00 – 10:30

Session B05

Spatially Resolved Characterization

B051 Feeding PEM Fuel Cells

Anthony Kucernak¹, Andrei A. Kulikovskiy² and Alexei A. Kornyshev¹

¹Imperial College, London / United Kingdom

²Forschungszentrum Jülich, Jülich / Germany

B052 Analysis of Performance Losses in Polymer Electrolyte Fuel Cells by Locally Resolved Electrochemical Impedance Spectroscopy

Ingo A. Schneider, Alexander Wokaun and Günther G. Scherer

Paul Scherrer Institut, Villigen PSI / Switzerland

B053 Interpretation of Spatially Resolved Impedance Measurements of PEM Fuel Cells

Alex Hakenjos, Dietmer Gerteisen and Christopher Hebling

Fraunhofer Institute for Solar Energy Systems, Freiburg / Germany

B054 Mechanistic Modeling of PEM Fuel Cells: Application to Serpentine Flow Fields

Brant A. Peppley, Jon G. Pharoah, Kunal Karan, David Harvey, Dan Hamilton and Wei Sun

Queen's University at Kingston, Kingston, Ontario / CANADA

B055 *In situ* Investigation of Two-Phase Flow Phenomena in Polymer Electrolyte Fuel Cells by Neutron Imaging

Denis Kramer¹, Jianbo Zhang², Yoshitaka Ono², Eberhard Lehmann³,

Alexander Wokaun¹, Kazuhiko Shinohara² and Günther G. Scherer¹

¹Paul Scherrer Institut, Electrochemical Laboratory, Villigen PSI / Switzerland

²Nissan Motor Co.

³Paul Scherrer Institut, ASQ Division, Villigen PSI / Switzerland

B056 Experimental Investigation of Current Density Distribution in Polymer Electrolyte Fuel Cells

Stefan Schönbauer and Heinz Sander

German Aerospace Center, Stuttgart / Germany

Wednesday, July 6, 11:00 – 12:30

Session B06

Mathematical Fuel Cell Modeling

B061 Using CFD Models to Understand Poisoning in PEM Fuel Cells

John W. Van Zee and Sirivatch Shimpalee
University of South-Carolina, Columbia / USA

B062 Semi-Analytical Models of PEFC and DMFC: New Effects in Cell Functioning

Andrei A. Kulikovsky
Forschungszentrum Jülich, Jülich / Germany

B063 A Multi-Scale Dynamic Mechanistic Model for Transient Analysis of PEFCs

Alejandro A. Franco¹, Pascal Schott¹, Christian Jallut² and Bernhard Maschke²
¹CEA Grenoble DRT/LITEN/DSEN/SGPAC, Grenoble / France
²Université Lyon, Villeurbanne / France

B064 Analysis of the PEM Fuel Cell Dynamics

Christoph Ziegler, Hongmei Yu and Jürgen O. Schumacher
Fraunhofer Institute for Solar Energy Systems, Freiburg / Germany

B065 Electrical and Thermal Cell-to-Cell Coupling in PEFC Stacks – A CFD Analysis

Stefan A. Freunberger¹, Felix Büchi¹ and Nedjib Djilali²
¹Paul Scherrer Institut, Villigen PSI / Switzerland
²University of Victoria, Victoria, British Columbia / Canada

B066 The Application of Numerical Simulation of PEFCs for Accelerated Product Development

Uwe Beuscher
W.L. Gore & Associates, Inc., Elkton, MD / USA

Wednesday, July 6, 14:00 – 15:30

Session B07

Model-Based Analysis of Fuel Cell Components

B071 Investigation of Two-Phase Behavior of Gas Diffusion Layers in PEFC

Nicklas Holmström, Jari Ihonen, Anders Lundblad and Göran Lindbergh
Royal Institute of Technology, Stockholm / Sweden

B072 Investigation of the Triple Phase Boundary of the PEFC

Till Kaz and Norbert Wagner
German Aerospace Center, Stuttgart / Germany

B073 Cathode Catalyst Layer as the Watershed in PEMFC

Jianfeng Liu and Michael Eikerling
Simon Fraser University, Burnaby, BC / Canada

B074 High Temperature PEM Fuel Cell Technology: Celtec[®]-P Membrane-Electrode-Assemblies for Reformed Hydrogen Fuel Cell (RHFC) Applications

Jörg Belack and Isabel Kundler
PEMEAS GmbH, Frankfurt / Germany

B075 Stochastic Approach for the Analysis of PEFC Behavior

Seiji Yoneda and Yoshihiro Ohno
Kanagawa University, Yokohama, Kanagawa / Japan

B076 Investigation of the Single Electrode Reactions in Polymer Electrolyte Fuel Cells

Holger Kuhn, Bernhard Andreaus, Alexander Wokaun and Günther G. Scherer
Paul Scherrer Institut, Villigen PSI / Switzerland

Wednesday, July 6, 16:00 – 17:30

Session B08

Poster Presentation

Thursday, July 7, 09:00 – 10:30

Session B09

Systems and Components

B091 On the Efficiency of Automotive H₂/O₂ PE Fuel Cell Systems

Felix N. Büchi¹, Mathias Reum¹, Stefan A. Freunberger¹ and Antonio Delfino²

¹Paul Scherrer Institut, Villigen PSI / Switzerland

²Conception et Développement Michelin, Givisiez / Switzerland

B092 Virtual Component Testing for PEM Fuel Cell Systems: An Efficient, High-Quality and Safe Approach for Suppliers and OEMs

Carl-Johan Sjöstedt and Chen De-Jiu, KTH, Stockholm / Sweden

Peter Prenninger, AVL List GmbH, Graz / Austria

Ian Faye, Robert Bosch GmbH, Stuttgart / Germany

Thomas Hülshorst, FEV Motorentechnik GmbH / Germany

Ashley Kells, Intelligent Energy Ltd. / United Kingdom

Ian Harkness, Johnson Matthey Fuels Cells / United Kingdom

Carsten Schönfelder, VKA RWTH Aachen / Germany

B093 Progress in DMFC Stack Development and System Integration at Forschungszentrum Jülich

Martin Müller, Ludger Blum, Hendrik Dohle, Nicola Kimiaie, Jürgen Mergel,

Markus Nölke, Holger Janssen and Detlef Stolten

Forschungszentrum Jülich, Jülich / Germany

B094 High Energy Power Unit (PU) for Portable Computing Based on a Novel Membrane

Emanuel Peled, Arnon Blum, Vladimir Livshits, Tair Duvdevani¹

and Hanan Terkel²

Tel-Aviv University, Tel Aviv / Israel

B095 Energy Management of Fuel Cell Vehicles Operating in Fixed-Route Service

Ralf Bartholomaeus¹ and Andreas Fischer²

¹Fraunhofer Institute for Transportation and Infrastructure Systems,
Dresden / Germany

²Dresden University of Technology, Dresden / Germany

B096 Air-Cooled Fuel Cell Stack Made of Foil Materials

Martin Ruge and Michael Höckel

School of Engineering and Information Technology (HTI), Biel / Switzerland

Thursday, July 7, 11:00 – 12:30

Session B10

Applications

B101 Fuel Cells - in View from Applications

Alexander Dyck
CEAG AG, Ostbevern / Germany

B102 The PEM Power Plant Project

Adriaan Verhage¹, Erik Middelman¹ and Joop Pek²
¹NedStack Fuel Cell Technology BV, Arnhem / The Netherlands
²Akzo Nobel Base Chemicals B.V., Amersfoort / The Netherlands

B103 Economic Analysis of Control Strategies for Combined Heat and Power Fuel Cell Systems Operating in Electrical and Thermal Networks

Whitney G. Colella¹, Aditya Jhunjunwala², Nigel Teo²,
Wallace Wai Kean Wong² and Tee Sing Tang³
¹Civil and Environmental Engineering, Stanford University, Stanford, CA / USA
²Management of Science and Engineering, Stanford Univ., Stanford, CA / USA
³Mechanical Engineering, Stanford Univ., Stanford, CA / USA

B104 Model-Aided Testing of a PEMFC CHP System

Patrick König¹, Andre Weber¹, Ludwig Jörissen², Thomas Aicher³,
Norbert Lewald⁴ and Ellen Ivers-Tiffée¹
¹Universität Karlsruhe (TH), Karlsruhe / Germany
²ZSW Ulm, Ulm / Germany
³Fraunhofer ISE, Freiburg / Germany
⁴Stadtwerke Karlsruhe, Karlsruhe / Germany

B105 Assessment of the Application of Fuel Cell APUs and Starter-Generators to Reduce Automobile Fuel Consumption

Thomas Grube, Bernd Höhle and Reinhard Menzer
Forschungszentrum Jülich, Jülich / Germany

B106 The Pios Hydrogen Tricycle: Practical Experience in the Design, Integration and Testing of a Fuel Cell Vehicle for Individual Transport and Demonstration

Joerg Weigl and Hamdani Saidi
Universiti Teknologi Malaysia, Kuala Lumpur / Malaysia

Thursday, July 7, 14:00 – 15:30

Session B11

Development of DMFC Materials

B111 Characterization of DMFCs for Portable Devices

Steffen Eccarius, Timbul Manurung and Christopher Hebling
Fraunhofer Institute for Solar Energy Systems, Freiburg / Germany

B112 Influence of Thermal Treatment on Ru-Se Cathode Materials for DMFC

Hua Cheng, Wanqing Yuan and Keith Scott
University of Newcastle upon Tyne, Newcastle upon Tyne / United Kingdom

B113 Radiation Grafted Fuel Cell Membranes: Current State of the Art at PSI

Lorenz Gubler, Selmiye Alkan Gürsel, Michal Slaski, Friederike Geiger,
Günther G. Scherer and Alexander Wokaun
Paul Scherrer Institut, Villigen PSI / Switzerland

B114 Influence of Interfacial Water Activity in the Electrocatalysis of Cathodic Oxygen Reduction and Anodic CO and Methanol Oxidation: Combination of Electrochemistry and Synchrotron-Based in-situ XAS

Sanjeev Mukerjee, Vivek S. Murthi and Karthikeyan Ramamoorthy
Northeastern University, Boston, MA / USA

B115 Characterization of Novel ETFE-Based Membrane and its Performance in DMFC

Ville Saarinen¹, Tanja Kallio¹, Mikael Paronen² and Kyösti Kontturi¹
¹Helsinki University of Technology, HUT / Finland
²University of Helsinki, Helsinki / Finland

B116 Developments for Improved Direct Methanol Fuel Cell Stacks for Portable Power

Carsten Cremers^{1,2}, Martin Scholz¹, Alexander Racz², Walter Knechtel³,
Johannes Rittmayr³, Franz Grafwallner³, Helmut Peller³ and Ulrich Stimming^{1,2}
¹Bavarian Center for Applied Energy Research, Garching / Germany
²Technische Universität München, Garching / Germany
³ET EnergieTechnologie GmbH, Munich / Germany

Thursday, July 7, 16:00 – 17:30

Session B12

Reforming

B121 Preferential Oxidation of Carbon Monoxide in a Hydrogen-Rich Gas Mixture in Catalytically Coated Turbulence Structures

Jan Meißner, Joachim Pasel, Ralf Peters and Detlef Stolten
Forschungszentrum Jülich, Jülich / Germany

B122 Development of ATSR (Auto Thermal Steam Reformer)

Jun Ono¹, Yasushi Yoshino¹, Takeshi Kuwabara¹, Siro Fujisima¹,
Shigeki Kobayashi¹ and Saburo Maruko²
¹Toyo Radiator Co. Ltd., Hadano-shi. Kanagawa / Japan
²Nippon Chemical Plant Consultant Co., Tokyo / Japan

B123 Development of a 30 kW Diesel ATR Reformer

Melanie Grote, Martin Konrad, Roland Wruck, Lutz Hartmann,
Christian Mengel, Klaus Lucka und Heinrich Köhne
Oel-Wärme-Institut gGmbH, Herzogenrath / Germany

B124 Novel Process for Evaporation of Liquid Hydrocarbons

Thomas Aicher¹ and Lothar Griesser²
¹Fraunhofer Institute for Solar Energy Systems, Freiburg / Germany
²Lothar Griesser Engineering, Zürich / Switzerland

B125 Micro-Structured Methane Steam Reformer with Integrated Catalytic Combustor

Carsten Cremers¹, Andrea Pelz¹, Ulrich Stimming^{1,2}, Katja Haas-Santo³,
Oliver Görke³, Peter Pfeifer³ and Klaus Schubert³
¹Bavarian Center for Applied Energy Research, Garching / Germany
²Technische Universität München, Garching / Germany
³Forschungszentrum Karlsruhe, Karlsruhe / Germany

B126 Sorbents for Natural Gas Desulfurization

Gokhan Alptekin, Margarita Dubovik and Sarah DeVoss
TDA Research, Inc., Wheat Ridge, CO / USA